SCIENCE.—SUPPLEMENT.

FRIDAY, OCTOBER 23, 1885.

PRICES FROM 1873 TO 1884.

IN the annual report issued by the mint department on the production of precious metals in 1884, there are given statistics of prices during the years 1883 and 1884. These statistics are in continuation of others of the same kind in previous reports. The figures for the years from 1825 to 1880 may be found in the quarterly report of the Bureau of statistics, No. 3, 1883–84; those for the years 1881 and 1882 in the report of the director of the mint for 1883; those for 1883 and 1884 in the present report. All of them, we are informed, were collected and arranged under the superintendence of Mr. Burchard, the former director of the mint, to whom belongs the credit for the work. The investigation is one which does not lie very obviously within the scope of the mint department, and recognition is due to the intelligence and activity which caused it to be undertaken.

The different reports, taken together, purport to give a continuous account of the fluctuations of general prices from 1825 to the present time. Such an account, if accurate and trustworthy, would be of great interest and value. Unfortunately the statistics have not been got together in a very careful way; and the general results which are deduced from them can be accepted only with liberal allowance for possible errors.

To the method adopted there can be little objection. It was to take the wholesale prices of a number of articles in New York, to reduce them to a common denominator, and then to calculate the arithmetical mean of the prices as reduced.

It can be easily illustrated by an example. Suppose that for three years the prices of cotton, wheat, and pig-iron, were as follows:

	1880.	1881.	1882.
Cotton	.10	.12	.08
Wheat	1.00	.80	1.50
Iron	20.00	30.00	40.00

Indicate the price of each article for the first year by 100, express the prices for the following years in percentages on that basis, and calculate the averages. The result is:

	1880.	1881.	1882.
Cotton	100	120	80
Wheat	100	80	150
Iron	100	150	200
Average.	100	116⅔	150

The average, or arithmetical mean, of the percentages here indicates a rise in prices over the average of 1880, of 16⅔ per cent in 1881, and of 50 per cent in 1882.

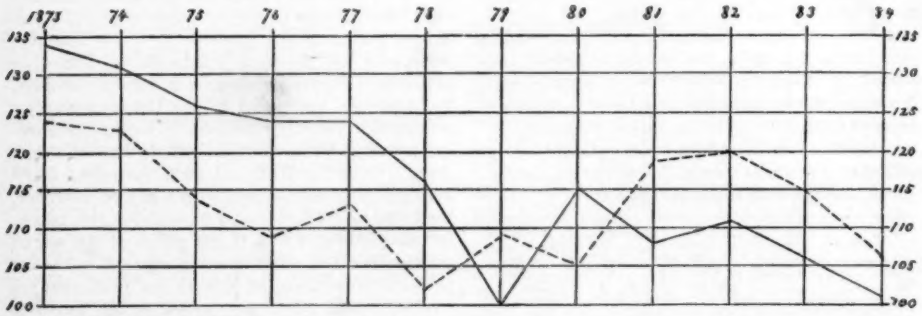
If the prices of a sufficiently large number of articles be taken, the averaged percentages indicate with sufficient accuracy the general rise or fall of prices. This is the method adopted in the mint reports; and it is also adopted in the *London economist's* annual table of prices. If applied with care, it is probably the safest way of calculating the rise and fall of general prices. Objections to it have been much urged, and other methods of calculation have been suggested and tried; but the various experiments seem to show pretty clearly that the simple arithmetical mean of the prices of a large number of articles gives as good an indication of the general fluctuations as we can hope to get.

Unfortunately the method has been applied with too little care and discrimination in the tables before us. In the first place, one cannot be sure that the prices quoted are the real market prices. For the years previous to 1873, they are taken bodily from two Treasury reports, those for 1863 and for 1873, in which tables of prices for a long series of years were brought together. There has always been a suspicion that these prices were largely made up by the clerks in the Treasury office, and that they were not worth much as a record of the real fluctuations. For the years after 1873, the figures were gathered specially for these mint reports, and may be more trustworthy. But even here there are obvious mistakes and inconsistencies. For instance, instead of taking the same articles consistently year by year, and deducing the average prices of these, the list changes almost every year. Thus for 1881 and 1882, the prices of 88 articles are given; in this year's report, however, for 1883 and 1884, those of 94 articles are taken. In other words, it is as if the prices of one set of articles for this year were compared with the prices of another set of articles for next year; a method which obviously, so far as the two sets vary, vitiates any comparison between them. It is part of the same error in these tables, that an article, after having been quoted and reckoned for a few years, suddenly disappears entirely, while another one perhaps takes its place, and is reckoned in the general average. One is therefore not surprised to find the results to be on their face inconsistent with each other. Thus the average

prices of 1884 are given as 92.2 per cent of those of 1883; yet side by side other figures are given which make the ratio 91 per cent.

Nevertheless, it would be going too far to say that the results are quite without value. A very large number of articles are included in the comparison, which gives a probability that the mistakes will balance each other, or will not appreciably affect the general results. It is not unreasonable to believe that the figures which are finally given as indicating the rise and fall of general prices for the successive years, although they cannot be accepted as an accurate gauge of the ascertainable change from any one year to the next year, yet represent fairly enough the general fluctuations of the series of years. They are at all events probably as good an index of the actual changes as the tables of the *London economist*, which have been much quoted and used. We reproduce the mint figures in the accompanying chart for the years since 1873, and for comparison give also the *Economist* figures, which indicate the course of prices in England. It should be said that, for both countries, the standard (indicated by the number 100) is the average range of prices of the years 1845–50. Those were the years just before the Australian and Californian gold discoveries, and the average for them has always been used by the *Economist* as the basis of comparison in its table of prices.

We have arranged the mint figures on the same basis, using for that purpose the figures for 1845–50 given in the earlier mint report. This method of comparison is of course open to objections, but seems on the whole to be the best:



Prices in England ——————

Prices in United States - - - - - - - - - -

The figures begin with 1873, a year of speculation and of inflated prices all over the world; and it will be seen that in both countries prices fell continuously during the long years of depression from 1873 to 1878. The fall in England was from 134 to 116; and in England there was in 1879 a still further fall to 100. That is, in 1879 prices in England had gone down to the level of the years 1845–50. In this country, the fall from 1873 to 1878 was from 124 to 102. The revival began here earlier than in England, and from 1878 to 1879 there was already a rise from 102 to 109. After 1879 the tendencies in both countries for a few years was to a rise. A temporary fall, it is true, is indicated in the United States from 1879 to 1880; but one cannot but look at this fall with suspicion, and ascribe it, at least in part, to some of the mistakes made in calculating the mint figures. In England the highest point since 1878, according to the *Economist*, was reached in 1880. But there are reasons, which there is not space to explain, for ascribing the high figure for that year to the peculiar methods of the *Economist*, and for believing that there was in reality but little fall in 1882 as compared with 1880. In the Uuited States there was a fairly steady rise from 1878 to 1882. Since 1882 there has been a steady fall in both countries. Last year (1884) prices were at 101 in England, and at 106 in this country; in other words, notwithstanding the severe depression, they had not gone so low as the lowest points reached during the last period of depression in England in 1879, and in this country in 1878. F. W. Taussig.

THE NEW PHILOLOGY.

The new school of philology in Germany, of which Professor Brugmann is one of the ablest representatives, claims to be a legitimate advance on its predecessors in the direction of scientific sobriety and precision. The older scholars from Bopp down to a few years ago, says Sievers (in his article on Indo-Germanic philology, in the Encyclopædia Britannica), had naturally occupied

themselves largely with glottogonic problems; and some of them had adopted misleading metaphors, as Schleicher in his theory that language was an organism, and linguistics one of the natural sciences. Brugmann, in a recent pamphlet,[1] charges further that mechanical methods were employed in comparisons of words, as when the fullest form was judged to be always the oldest. The new school discards glottogonic problems, on the ground that the materials for their discussion are, at least at present, insufficient, rejects the misleading metaphors, and abstractions in general, and professes to confine itself to known facts. But the principle on which it lays most stress is that "our general views of language and methods of comparison should be formed after study of living languages, because these alone are controllable in detail, and can give an insight into the motive forces that shape and modify language" (Sievers). The most prominent of these forces are held to be two: phonetic variation, to whose laws there are no exceptions, and which is differentiating in its tendency; and analogy, an assimilating force, whose procedures cannot be reduced to rule. An example of the first is the separation of the old English short *a* (pronounced as in Italian) into two sounds, that in *mare* before *r*, and that in *make* before all other consonants; an example of the second is found in the plural of *book*, which was formed in the older language simply by change of vowel, like *feet* from *foot*, but was afterwards assimilated to other plurals in *s*.

These are the views that Brugmann defends in his pamphlet. It consists of three pieces. The first, an address delivered when he entered on the duties of his university chair, is a statement of the relation between linguistics and philology. Defining the latter, after Böckh, as the science that investigates the historical manifestation of the mind of peoples, that is, their development of culture, he points out that the science of language is merely one branch of this larger department, and that all attempts to draw a line between them have failed. After exhorting scholars of all linguistic departments, wider and narrower, Indo-Germanists, Hellenists, Latinists, Germanists and others, to work in harmony, he gives a short sketch of the progress recently made in the systematic investigation of the general vital conditions of language. The foundation for this, he says, was laid by Wilhelm von Humboldt, and Steinthal, and W. D. Whitney had also contributed; Scherer, in 1868, showed the importance of analogy in the explanation of older forms, and Leskien soon after announced the doctrine that the laws of phonetic variation are in themselves subject to no exception. Other scholars, among whom are Osthoff, Paul, Delbrück, Sievers and Brugmann, have continued the investigation and application of principles. Brugmann closes with the expression of the opinion that for young students of classical and Germanic philology, while Sanskrit is important, it is still more important to understand the nature of language and the laws that govern its growth.

The second and longest paper is Brugmann's reply to a 'Criticism of the latest linguistic investigations' by Georg Curtius, whose recent death has deprived Indo-Germanic philology of one of its most distinguished and useful workers. Curtius had treated of four points: phonetic laws, analogy, the Indo-Germanic vowel-system, and the origin of primitive Indo-Germanic forms; Brugmann takes these up in the same order. The principle of the constancy of phonetic laws, defended by the new school against Curtius, is understood by them to mean that the same sound under the same conditions always moves in the same direction and undergoes the same change,—there are no exceptions or irregularities. Brugmann draws his proof of this proposition from a consideration of the physical and psychical processes concerned in the production of words, and the way in which the individuals of a community act on one another in the production of sounds. Phonetic change, he says, is at the same time a psychical and a physical process: individuals are constantly modifying their pronunciation, but the modifications are controlled by the necessity of being understood by the community, and thus all the members of the community necessarily move on together; when the phonetic change is completed, it is inconceivable that in different words different courses should be taken, for the pronunciation is not learned separately for each individual word, but the same phonetic conditions necessarily induce the same feeling and the same pronunciation. Curtius insists that many unexplained cases of phonetic change exist, and that an inductive demonstration of the constancy of the law of phonetic change is impossible. Brugmann admits that such demonstration is, in the nature of the case, impossible, since so much of the necessary material has perished, but holds that the number of unexplained changes is constantly diminishing, many of the seeming 'exceptions' to rules depending on false etymologies, or resulting from the fact that one dialect has borrowed from another, in which different laws of literal interchange exist, or being otherwise explicable. Curtius thinks that a letter is sometimes retained in a particular form, when it has disappeared from

[1] *Zum heutigen stand der sprachwissenschaft.* Von KARL BRUGMANN. Strassburg, *Trübner*, 1885. 144 p. 8°.

phonetically similar forms, because it was felt to be significant; Brugmann replies that the processes of phonetic change are unconscious, quite ignoring the meaning of sounds, as, in fact, we often find that phonetic decay removes letters that we know to have been originally significant.

The second principle discussed by Curtius, analogy, is one the influence of which has always been more or less acknowledged by writers on language; but it has usually been regarded as a secondary and sporadic force, leading (as the current expression 'false analogy' indicates) to malformation and confusion. The new school holds, on the contrary, that analogy is a natural, universally active force, equally prominent in the processes of forming and of learning languages. In our ordinary speaking, words present themselves to us in groups, and a new word is assigned to its most natural group, and treated accordingly. "The action of groups is, along with phonetic change, at least in our observation of accessible periods, the most important factor in the development of language" (Paul). A familiar example in English is the tendency to convert strong preterites into weak, as 'crowed' instead of the old 'crew.' The analogic process, being thus assimilative, acts in opposition to the differentiating influence of phonetic change, which more commonly tends to destroy the similarity between words. The younger philologists call in the principle of analogy to account for a number of phonetic phenomena, which the older generation of scholars either treated as unintelligible anomalies or endeavored to explain by referring them to the desire to retain significant letters, etc. Curtius objects to this wide extension of the principle, on the ground that its employment is arbitrary, and that it rests on no better basis than the admitted usage of modern languages. Brugmann rejoins that there is no reason to suppose a difference in this respect between ancient and modern languages; and Delbrück, in his 'Einleitung in das sprachstudium,' endeavors to define the character of analogical change.

The third and fourth points of Brugmann's reply to Curtius relate to questions of Indo-Germanic grammar, such as whether the primitive Indo-Germanic language had not only the vowels *a*, *i*, *u*, as the older school holds, but also *e*, *o*, together with diphthongs and sonant nasals and liquids, and what the origin of the inflections was. Brugmann remarks that the new philology does not absolutely avoid all glottogonic or morphogonic problems, but only those in which there are clearly not sufficient data for a solution; and whether it is worth while to attack any given problem, each man must decide for himself. Finally, in the third piece of his pamphlet, Brugmann replies to some points made by Johannes Schmidt.

The new philological school may be said to represent a more rigid adherence to law in the treatment of linquistic questions. While gratefully acknowledging the eminent services rendered to the science of language by Bopp, Grimm, Pott, Benfey, Schleicher, Curtius, and others, it claims to carry out more consistently the principles they lay down, and to fill in part the gaps they left.

C. H. Toy.

CHEMICAL NOMENCLATURE.

A committee of fourteen chemists, including such eminent men as Williamson, Frankland, Crum Brown, Odling, and Armstrong, presented their third report on chemical nomenclature to the British association at the Aberdeen meeting. This committee was entrusted with the duty of "drawing up a statement of the varieties of chemical names which have come into use, and of indicating the causes which led to their adoption, as well as considering what can be done to bring about some convergence of the views on chemical nomenclature obtaining among English and foreign chemists."

This weighty committee produce, as might be expected, an eminently conservative report; they regard as ill advised any attempt, on etymological grounds, to change a system so firmly established as that involved in the present use of the prefixes *hypo* and *hyper*.

After confirming the terminations *ic* and *ous*, the committee considers the minor question how far the termination *ous* ought to be written in the forms *ious* and *eous*. The answer is: as seldom as possible; cupreous has given way to cuprous, and 'ruthenious' and 'iridious' should also lose the superfluous *i*.

In answer to the question whether the termination *ic* should be employed in the names of salts of which only one class is known—as magnesic sulphate instead of magnesium sulphate, the committee says: "There is something to be claimed for both systems; and, as the diversity of practice does not lead to confusion, the question need not be regarded as vital." In our opinion, the committee might have exerted their influence to suppress the use of the unmeaning and often non-euphonious termination *ic*. Such terms as 'zincic' and 'nickelic' offend the ears of hearers; 'scandic' and 'ytterbic' would be unwelcome.

The committee calls attention to the advantage of affixing the syllable *ic* to the names of positive radicals in ethereal salts. The ambiguity arising in *speaking* ethyl phenylacetate, which might be taken for ethylphenyl acetate, can be obviated by

saying ethylic phenylacetate, and ethylphenylic acetate.

It is further remarked that of late years chemists have not been sufficiently careful in applying numerical designations to substances; thus arsenious oxide is sometimes called arsenic trioxide, although the formula of gaseous arsenious oxide is As_4O_6.

The committee considers at some length the nomenclature of acid salts, of basic salts, of sulphur salts and of double salts, pointing out some inconsistencies, suggesting some changes and proposing, very sparingly, new terms. Being the third report, many topics treated previously are not touched, and the report is consequently not very wide-reaching.

In this connection, we remark that the London chemical society, a few years ago, issued to the abstracters for its journal a series of instructions on chemical nomenclature and notation, which have been of the greatest service in securing uniformity in writing chemical language. American chemists are largely following the instructions and simple rules there laid down; and, so far as the English language is concerned, a commendable uniformity and perspicuity already obtains.

H. CARRINGTON BOLTON.

POISONOUS WATERS IN THE COCOS OR KEELING ISLANDS.

IN a recent book of travel[1] from the pen of Henry O. Forbes of Aberdeen, Scotland, an account is given of a visit to the Cocos or Keeling Islands, which contains some new facts bearing on the history of coral islands that are specially interesting, as they supplement the studies of Charles Darwin at the same locality. The Keeling Islands, as they are usually called, are situated in the Indian Ocean about 800 miles southwest of the Straits of Sunda. They were visited by Darwin in 1836, and by Forbes in 1878. It was while exploring these islands that Darwin's well-known hypothesis of the formation of coral reefs and atolls first suggested itself.

One of the most instructive portions of Mr. Forbes's observations relates to the rising of poisonous waters in the lagoon enclosed by the Keeling Islands, immediately after a cyclone which occurred January 28, 1876, a description of which was furnished by Mr. G. C. Ross, the present proprietor of the islands.

On the 25th the mercurial barometer indicated some unusual atmospheric disturbance, and the air felt unusually heavy and oppressive. On the 28th it fell to close on 28 inches, a warning which gave time for all boats to be hauled to a place of safety, and other preparations for a storm to be made. On the afternoon of the same day there appeared in the western sky an ominously dark bank of clouds, and at 4 P.M. a cyclone of unwonted fury burst over that part of the Indian Ocean. About midnight on the 28th the sea rose suddenly, and rushed inland more than 150 yards from high water mark. The storm attained its greatest height about one o'clock on the morning of the 29th. At that hour no object raised a foot or two above the ground could resist its fury. The inhabitants saved themselves only by lying in hollows of the ground. To what distance the barometer might have fallen it is impossible to say, for the mercurial was carried away; two aneroids gave it at 26½ inches.

The following morning broke bright and calm, but not a speck of green could be seen anywhere within the compass of the islands. Round the whole atoll the solid coral conglomerate floor was scooped under, broken up and thrown in vast fragments on the beach. On the eastern shore of Home Island, Mr. Forbes observed a wall of many yards breadth, portions of which had been thrown up clear over the external high rim of the island, and several yards inward among the cocoanut trees.

About 36 hours after the cyclone the water on the eastern side of the lagoon was observed to be rising up from below of a dark color. The origin of the spring, which continued to ooze out for about ten or fourteen days, lay somewhere between the north end of New Selima and the north end of Gooseberry Island. Its color was of an inky hue, and its smell 'like that of rotten eggs.' From this point it spread southwest as far as the deep baylet in Southeast Island, where, meeting the currents flowing in at the westward and northern entrances, which run, the one round the western, the other round the eastern shore of the lagoon, its westward progress was stopped; whereupon, turning northward through the middle of the lagoon (becoming slightly less dark as it proceeded) it debouched in the ocean by the north channel. Within twenty-four hours every fish, coral and mollusk, in the part impregnated with this discoloring substance —probably hydrosulphuric or carbonic acid—died. So great was the number of fish thrown on the beach, that it took three weeks of hard work to bury them in a vast trench dug in the sand.

At the time of Mr. Forbes's visit the islands were slowly recovering from this sad disaster. He carefully examined that part of the lagoon over which the poisoned waters flowed, and described its effect as follows: "The whole eastern half of the lagoon

[1] *A naturalist's wanderings in the Eastern Archipelago. A narrative of travel and exploration from 1878 to 1883.* New York, *Harper*, 1885. 8°.

was one vast field of blackened and lifeless coral stems, and of the vacant and lusterless shells of giant clams and other mollusks, paralyzed and killed in all stages of expansion. Everywhere both shells and corals were deeply corroded, the corals especially being in many places worn down to the solid base. Since the catastrophe there has been, till almost the date of my visit, no signs of life in that portion of the lagoon; I saw only a very few fishes, and only here and there a new bunch of Madrepora and Porites."

A similar field of dead corals was observed in this lagoon during the visit of the Beagle in 1836. The destruction of the corals was accounted for by Darwin, by assuming that Southeast Island had at one time been divided into several islets by channels whose closing up had prevented the water in the lagoon from rising so high as formerly; and that, therefore, the corals, which had attained their utmost possible limit of upward growth, must have been killed by occasional exposures to the sun. This statement is cited by Forbes who, judging from the fact that an earthquake took place at the Keeling Islands two years before the visit of the Beagle, considers it very probable that an eruption of poisoned water, like that of 1876, may have been brought about by the earthquake, and may have caused the death of the corals observed by Darwin.

Mr. Forbes thinks that an earthquake took place at the time of the cyclone in 1876, although no tremblings of the earth were noted by the people on the island. He considers "the waves, as well as the darkened waters which were issued, doubtless from a submarine vent, as almost certainly the result of volcanic disturbance in close vicinity of the atoll." It seems to the present writer, however, that this hypothesis is but poorly sustained by the facts observed. A similar rising of the waters is recorded in connection with other cyclones. Chain Atoll, in the Low Archipelago, was completely devastated by a hurricane in 1825, during which not less than 300 lives were lost. Thus in two instances, the agitation of the sea about atolls during great storms has been so great as to suggest earthquakes, yet no shaking of the land was recorded in either instance. The only safe conclusion, therefore, seems to be that extremely violent storms are capable of causing the sea to rise to a much greater height than had been supposed. On the other hand, certain writers, who consider that earthquakes may be brought about by a dimunition of atmospheric pressure, might claim these as striking illustration of their hypothesis, providing positive evidence of the occurrence of earthquakes in connection with the storms could be had.

The eruption of this colored water, charged with sulphuretted hydrogen etc., in the lagoon of the Keeling Islands, might perhaps be accounted for, by assuming that the relief of atmospheric pressure, during the cyclone, allowed the gases originating from the decomposition of organic matter imprisoned in the mud of the lagoon to rise to the surface. As the atolls are entirely of organic origin, it seems by no means improbable that organic matter in a state of decomposition might occur in the mud beneath the lagoon in quantity sufficient to account for the phenomena observed.

Another cause adequate to destroy mollusks, coral polyps, etc., in the lagoon of an atoll, is furnished by rain, which frequently freshens the water, as has been noted by both Darwin and Forbes.

THE NIPON CENTRAL EDUCATIONAL ASSOCIATION.

The main object of this association is to promote the interests of education and science in Japan. Its regular meetings are held monthly in the Lecture hall of the Tokio university, and at these times a lecture is usually delivered by some prominent member, or papers upon educational or scientific subjects are read. There is a standing committee whose duty it is to give all possible information sought on the part of the local associations or others.

The association publishes monthly bulletins, which are distributed among its members. These bulletins contain reports or reviews of the lectures delivered and papers read at the regular meetings, and also other papers upon educational and scientific matters. The number of members of the association is, at the present time, about four thousand; and it is a matter of congratulation that the number is monthly and yearly increasing. The government recognizes the association as one calculated to promote the interests of education and of science in general, and annually votes it a money appropriation or subsidy.

EXCAVATION OF THE TEMPLE OF LUXOR.[1]

Of all ruins, or groups of ruins, in the land of Egypt, the temples and tombs of 'hundred-gated Thebes' stand foremost in majesty, variety and number. Here six great temples mark the site of a city, which for many centuries was the capital of the known world. Of these six temples, the four on the left bank are known to travellers and readers of travels as Goornah, Dayr-el-Baharee, the Ramesseum, and Medinet Haboo; the two on the right bank being Karnak and Luxor.

By far the most accessible, and consequently

[1] Condensed from the *Illustrated London news.*

the most familiar, of these half-dozen Theban temples, is the great Temple of Luxor, which has just been excavated by Professor Maspero. Yet, till now, Luxor has not in itself been nearly so rich in objects of interest as any of the neighboring sites. Not only was the great temple three-fourths buried under the accumulated rubbish of ages, but its courts and colonnades formed the actual nucleus of the Arab half of the modern village. The Moslem population has settled, apparently from mediæval times, in and around the temple, at the southward end of the mound. Here, building always with mud bricks crudely dried in the sun, each generation erecting its congeries of hovels on the ruins of the hovels made by its predecessors, the Arabs of Luxor have gone on from century to century accumulating rubbish upon rubbish and mud upon mud, till they have thrown up an artificial hill some forty-eight or fifty feet in height. As the hill rose, the temple necessarily became swallowed up.

To sweep away all these barracks, stores, houses, huts, pigeon-towers, stables and refuse-heaps, has been the earnest desire of Professor Maspero, ever since his acceptance of the important post left vacant, in 1881, by the death of Mariette Pasha. He obtained from the Egyptian minister of public works the necessary authorization for treating with the fellaheen, the basis of the negotiation being that each squatter should receive a cash indemnity for his house and a piece of land equivalent in extent to the area covered by the said house and its dependencies. It was further arranged that the Egyptian government should find the money for the liquidation of the indemnities. Some of the temple-folk would sell, and some stoutly refused to be bought out, except upon such terms as made negotiation well-nigh impossible. Meanwhile, there was another financial question to be settled,—namely, the expenses of excavation. The Egyptian government had paid the indemnities, and could do no more; yet, to get rid of the squatters was of little avail so long as there remained fifty feet of soil to be cleared and carted away. A subscription, simultaneouly started in the *Journal des débats* and the London *Times*, met, however, with so liberal a response (especially in Paris), that this question of ways and means was settled in two or three days, and in the month of July, 1884, the order was given to commence operations.

Our illustration shows the courtyard of Amenhotep III. with the excavations in progress. We here find ourselves admitted into the precincts of the courtyard, immediately behind the government store-house, of which one corner and a small window are seen between the pillars to the right. The spectator stands with his back to the Arabian chain and his face to the Libyan range, one long spur of the great western mountain and a glimpse of the Nile being visible behind the highest group of Arabs to the left of the picture. The mud huts, the mud walls built up between the columns, the asses, and goats, and village folk, are still in part occupation of the place. To the left, however, a hovel or two have been demolished; and, on the rubbish heap thus created, we see a group composed of two Europeans and some five or six better-class natives.

EXCAVATIONS GOING ON IN THE COURT YARD OF THE TEMPLE OF LUXOR.

— The *Athenæum* states that "somewhat late in the day the inhabitants of Syracuse have erected a monument to Archimedes."

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saying ethylic phenylacetate, and ethylphenylic acetate.

It is further remarked that of late years chemists have not been sufficiently careful in applying numerical designations to substances; thus arsenious oxide is sometimes called arsenic trioxide, although the formula of gaseous arsenious oxide is As_4O_6.

The committee considers at some length the nomenclature of acid salts, of basic salts, of sulphur salts and of double salts, pointing out some inconsistencies, suggesting some changes and proposing, very sparingly, new terms. Being the third report, many topics treated previously are not touched, and the report is consequently not very wide-reaching.

In this connection, we remark that the London chemical society, a few years ago, issued to the abstracters for its journal a series of instructions on chemical nomenclature and notation, which have been of the greatest service in securing uniformity in writing chemical language. American chemists are largely following the instructions and simple rules there laid down; and, so far as the English language is concerned, a commendable uniformity and perspicuity already obtains.

H. CARRINGTON BOLTON.

POISONOUS WATERS IN THE COCOS OR KEELING ISLANDS.

IN a recent book of travel[1] from the pen of Henry O. Forbes of Aberdeen, Scotland, an account is given of a visit to the Cocos or Keeling Islands, which contains some new facts bearing on the history of coral islands that are specially interesting, as they supplement the studies of Charles Darwin at the same locality. The Keeling Islands, as they are usually called, are situated in the Indian Ocean about 800 miles southwest of the Straits of Sunda. They were visited by Darwin in 1836, and by Forbes in 1878. It was while exploring these islands that Darwin's well-known hypothesis of the formation of coral reefs and atolls first suggested itself.

One of the most instructive portions of Mr. Forbes's observations relates to the rising of poisonous waters in the lagoon enclosed by the Keeling Islands, immediately after a cyclone which occurred January 28, 1876, a description of which was furnished by Mr. G. C. Ross, the present proprietor of the islands.

On the 25th the mercurial barometer indicated some unusual atmospheric disturbance, and the air felt unusually heavy and oppressive. On the 28th it fell to close on 28 inches, a warning which gave time for all boats to be hauled to a place of safety, and other preparations for a storm to be made. On the afternoon of the same day there appeared in the western sky an ominously dark bank of clouds, and at 4 P.M. a cyclone of unwonted fury burst over that part of the Indian Ocean. About midnight on the 28th the sea rose suddenly, and rushed inland more than 150 yards from high water mark. The storm attained its greatest height about one o'clock on the morning of the 29th. At that hour no object raised a foot or two above the ground could resist its fury. The inhabitants saved themselves only by lying in hollows of the ground. To what distance the barometer might have fallen it is impossible to say, for the mercurial was carried away; two aneroids gave it at 26½ inches.

The following morning broke bright and calm, but not a speck of green could be seen anywhere within the compass of the islands. Round the whole atoll the solid coral conglomerate floor was scooped under, broken up and thrown in vast fragments on the beach. On the eastern shore of Home Island, Mr. Forbes observed a wall of many yards breadth, portions of which had been thrown up clear over the external high rim of the island, and several yards inward among the cocoanut trees.

About 36 hours after the cyclone the water on the eastern side of the lagoon was observed to be rising up from below of a dark color. The origin of the spring, which continued to ooze out for about ten or fourteen days, lay somewhere between the north end of New Selima and the north end of Gooseberry Island. Its color was of an inky hue, and its smell 'like that of rotten eggs.' From this point it spread southwest as far as the deep baylet in Southeast Island, where, meeting the currents flowing in at the westward and northern entrances, which run, the one round the western, the other round the eastern shore of the lagoon, its westward progress was stopped; whereupon, turning northward through the middle of the lagoon (becoming slightly less dark as it proceeded) it debouched in the ocean by the north channel. Within twenty-four hours every fish, coral and mollusk, in the part impregnated with this discoloring substance —probably hydrosulphuric or carbonic acid—died. So great was the number of fish thrown on the beach, that it took three weeks of hard work to bury them in a vast trench dug in the sand.

At the time of Mr. Forbes's visit the islands were slowly recovering from this sad disaster. He carefully examined that part of the lagoon over which the poisoned waters flowed, and described its effect as follows: "The whole eastern half of the lagoon

[1] *A naturalist's wanderings in the Eastern Archipelago. A narrative of travel and exploration from 1878 to 1883.* New York, *Harper*, 1885. 8°.

was one vast field of blackened and lifeless coral stems, and of the vacant and lusterless shells of giant clams and other mollusks, paralyzed and killed in all stages of expansion. Everywhere both shells and corals were deeply corroded, the corals especially being in many places worn down to the solid base. Since the catastrophe there has been, till almost the date of my visit, no signs of life in that portion of the lagoon; I saw only a very few fishes, and only here and there a new bunch of Madrepora and Porites."

A similar field of dead corals was observed in this lagoon during the visit of the Beagle in 1836. The destruction of the corals was accounted for by Darwin, by assuming that Southeast Island had at one time been divided into several islets by channels whose closing up had prevented the water in the lagoon from rising so high as formerly; and that, therefore, the corals, which had attained their utmost possible limit of upward growth, must have been killed by occasional exposures to the sun. This statement is cited by Forbes who, judging from the fact that an earthquake took place at the Keeling Islands two years before the visit of the Beagle, considers it very probable that an eruption of poisoned water, like that of 1876, may have been brought about by the earthquake, and may have caused the death of the corals observed by Darwin.

Mr. Forbes thinks that an earthquake took place at the time of the cyclone in 1876, although no tremblings of the earth were noted by the people on the island. He considers "the waves, as well as the darkened waters which were issued, doubtless from a submarine vent, as almost certainly the result of volcanic disturbance in close vicinity of the atoll." It seems to the present writer, however, that this hypothesis is but poorly sustained by the facts observed. A similar rising of the waters is recorded in connection with other cyclones. Chain Atoll, in the Low Archipelago, was completely devastated by a hurricane in 1825, during which not less than 300 lives were lost. Thus in two instances, the agitation of the sea about atolls during great storms has been so great as to suggest earthquakes, yet no shaking of the land was recorded in either instance. The only safe conclusion, therefore, seems to be that extremely violent storms are capable of causing the sea to rise to a much greater height than had been supposed. On the other hand, certain writers, who consider that earthquakes may be brought about by a dimunition of atmospheric pressure, might claim these as striking illustration of their hypothesis, providing positive evidence of the occurrence of earthquakes in connection with the storms could be had.

The eruption of this colored water, charged with sulphuretted hydrogen etc., in the lagoon of the Keeling Islands, might perhaps be accounted for, by assuming that the relief of atmospheric pressure, during the cyclone, allowed the gases originating from the decomposition of organic matter imprisoned in the mud of the lagoon to rise to the surface. As the atolls are entirely of organic origin, it seems by no means improbable that organic matter in a state of decomposition might occur in the mud beneath the lagoon in quantity sufficient to account for the phenomena observed.

Another cause adequate to destroy mollusks, coral polyps, etc., in the lagoon of an atoll, is furnished by rain, which frequently freshens the water, as has been noted by both Darwin and Forbes.

THE NIPON CENTRAL EDUCATIONAL ASSOCIATION.

The main object of this association is to promote the interests of education and science in Japan. Its regular meetings are held monthly in the Lecture hall of the Tokio university, and at these times a lecture is usually delivered by some prominent member, or papers upon educational or scientific subjects are read. There is a standing committee whose duty it is to give all possible information sought on the part of the local associations or others.

The association publishes monthly bulletins, which are distributed among its members. These bulletins contain reports or reviews of the lectures delivered and papers read at the regular meetings, and also other papers upon educational and scientific matters. The number of members of the association is, at the present time, about four thousand; and it is a matter of congratulation that the number is monthly and yearly increasing. The government recognizes the association as one calculated to promote the interests of education and of science in general, and annually votes it a money appropriation or subsidy.

EXCAVATION OF THE TEMPLE OF LUXOR.[1]

Of all ruins, or groups of ruins, in the land of Egypt, the temples and tombs of 'hundred-gated Thebes' stand foremost in majesty, variety and number. Here six great temples mark the site of a city, which for many centuries was the capital of the known world. Of these six temples, the four on the left bank are known to travellers and readers of travels as Goornah, Dayr-el-Baharee, the Ramesseum, and Medinet Haboo; the two on the right bank being Karnak and Luxor.

By far the most accessible, and consequently

[1] Condensed from the *Illustrated London news.*